

**OPTICAL RECORDING MEDIUM**

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**Abstract of JP2000173096**

**PROBLEM TO BE SOLVED:** To display a label even if it is not directly printed on a surface, increase strength against contamination due to external deposit or the like, and prevent medium weight from being biased due to printing by providing a recording and reflection layers on a transparent substrate with a group and sequentially stacking a label recording layer and the transparent substrate that are decomposed or deteriorated when light is absorbed on the reflection layer. **SOLUTION:** A recording layer for absorbing a laser beam directly or via another layer is provided on a transparent substrate 1 with a group and a metal reflection layer is provided on the recording layer directly or via another layer, and a label recording layer that is decomposed or is deteriorated at least when light is absorbed and a transparent substrate 2 are sequentially stacked on the reflected layer. A label recording beam such as laser beams and ultraviolet rays is applied from the side of the transparent substrate 2 for causing change in the label recording layer, thus creating a label in the label recording layer. Since the label recording layer is protected by the transparent substrate 2, it cannot be affected by an external deposit or the like.

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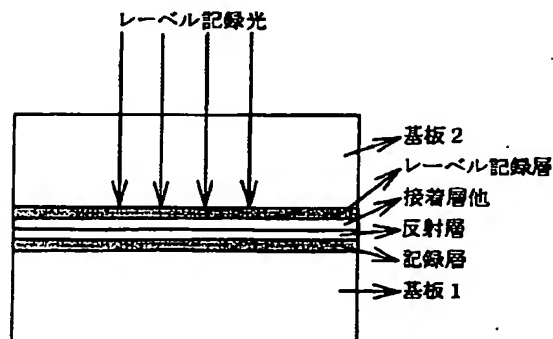
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(54) 【発明の名称】 光記録媒体

(57) 【要約】

【解決手段】 グループを有する透明な基板1上に直接又は他の層を介してレーザー光を吸収する記録層、該記録層の上に直接又は他の層を介して金属の反射層を有し、該反射層の上に少なくとも光を吸収すると分解あるいは変質するレーベル記録層および透明な基板2とを順次積層した光記録媒体。

【効果】 DVD-R等における貼り合わせ型片面記録タイプの光記録媒体において直接表面に印刷しなくともレーベル表示を可能にし、外部からの付着物等による汚れに強く印字による媒体重量の片寄りが無い光記録媒体が得られる。



## 【特許請求の範囲】

【請求項1】 グループを有する透明な基板1上に直接又は他の層を介してレーザー光を吸収する記録層、該記録層の上に直接又は他の層を介して金属の反射層を有し、該反射層の上に少なくとも光を吸収すると分解あるいは変質するレーベル記録層および透明な基板2とを順次積層した光記録媒体。

【請求項2】 基板2がグループ形状を持ち、かつ基板1と基板2のグループ形状が異なることを特徴とする請求項1に記載の光記録媒体。

【請求項3】 基板2がグループを持たないことを特徴とする請求項1に記載の光記録媒体。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は貼り合わせ型の光記録媒体において、レーベルを表面に直接印刷せずにレーザー光等の光により媒体内部に印字を可能にする光記録媒体に関する。

## 【0002】

【従来の技術】通常、表面に印刷できるタイプのCD-R等の光記録媒体においては表面にプリンタブル層を有し、その表面に直接インクジェットプリンタ等によりレーベル印刷を行う。ところが、このような方式の場合レーベル印刷面が表面にむき出しになっており、手で直接振れたり誤って飲料等が付着すると印刷面のしみや汚れが生じるといった点で好ましくない。また、レーベル印刷が媒体のある部分に集中すると媒体重量のバランスが悪くなり、高速読みだしタイプのドライブで不都合が生じる可能性がある。片面記録タイプのDVD-Rは基本的に0.6mm基板の上に有機色素、反射層を成膜した媒体に0.6mmの基板を貼り合わせている。よって、片面記録タイプのDVD-Rにおいてもレーベル印刷は媒体の表面に直接行うしか方法はなく、上記した問題点は何等解決されない。また、片面記録タイプのDVD-RAMも同じである。

## 【0003】

【発明が解決しようとする課題】本発明の目的は、DVD-R等における貼り合わせ型片面記録タイプの光記録媒体において直接表面に印刷しなくともレーベル表示を可能にし、外部からの付着物等による汚れに強く印字による媒体重量の片寄りが無い光記録媒体を提供することにある。

## 【0004】

【課題を解決するための手段】本発明者らは、上記課題を解決すべく鋭意検討を行なった結果、本発明を完成するに至った。即ち、本発明はグループを有する透明な基板1と透明な基板2の間に、少なくとも記録層、反射層及びグループ記録層を有する光記録媒体に関する。

## 【0005】

【発明の実施の形態】本発明の具体的構成について、以

下に説明する。本発明の光記録媒体の好ましい構成は、グループを有する透明な基板1上に直接又は他の層を介してレーザー光を吸収する記録層、該記録層の上に直接又は他の層を介して金属の反射層を有し、該反射層の上に少なくとも光を吸収すると分解あるいは変質するレーベル記録層および透明な基板2とを順次積層した構成のものである。図1に本発明の好ましい光記録媒体の基本的な断面図を示す。

【0006】レーベル記録層が無ければ通常の片面記録タイプの光記録媒体であるが、レーベル記録層を設けることによって媒体作製後、一般ユーザーが任意に透明基板2側からレーザービームまたは紫外線等のレーベル記録光を照射することでレーベル記録層に変化を起こさせレーベルを作製する事が可能となる。レーベル記録層は媒体の内部にあり記録層同様、透明基板に保護されているため外部からの付着物等による影響を全く受けない。万一、基板表面が汚れても拭き取る事で対処が可能である。また、光によるレーベル記録層の変化において基本的に重量変化は起こらないので、媒体のある部分に記録が集中しても媒体重量のバランスは一定で、高速読みだしタイプのドライブに対しても問題が起こりにくい光記録媒体である。

【0007】また、基本的に基板2は基板1と同じものでも良いが、グループはなくても良い。必要であれば基板2にあらかじめ任意のデザインの溝を設け、意匠性を持たせる事も可能である。

【0008】基板1及び基板2としては、例えばアクリル系樹脂、ポリカーボネート系樹脂、ポリオレフィン系樹脂等の公知の樹脂基板が挙げられる。記録層としては、一般に有機色素や相変化無機材料が挙げられる。有機色素の具体例としては、ポルフィリン系色素、シアニン系色素、アゾ系色素、ジピロメテン系色素、ポリメチン系色素、ナフトキノロン系色素が挙げられる。相変化無機材料の具体例としては、Ge、Sb、Teを主原料とする合金材料や、Ag、In、Sb、Teを主原料とする合金材料が挙げられる。

【0009】反射層としては、金、銀、アルミニウム、銅、白金等の金属や、これらの金属を含有する合金が用いられる。記録感度や反射率、繰り返し記録特性の改善のために基板1と記録層や記録層と反射層の間にZnSやSiO<sub>2</sub>、SiN等の無機誘電体層やポリマーからなる層を設けても良い。

【0010】レーベル記録層の材料としては記録光に対する感度や記録後のコントラストにより選択され、上記した記録層に用いられる有機色素や相変化無機材料の他にロイコ染料等の感熱材料（インク）やビスフェノールA等の顔色剤を用いることができ、更にこれらの材料を混合して用いることもできる。また、成膜法については材料により最適な方法が選択されるが、具体的には真空蒸着法、スパッタ法、スピコート法、ディップコー

ト法、スプレーコート法、ロールコート法、スクリーン印刷法等の公知の方法が挙げられる。

【0011】また、コントラストや感度改善等の為にレーベル記録層に隣接して金属や無機誘電体、ポリマーなどの層を設けることも可能である。さらに、直接またはこれらの層を介して互いに異なる種類のレーベル記録層を設けることで多色化などの機能性を付与することもできる。本発明は記録媒体側つまり基板1側にある記録層材料、反射層材料やさらに層構成によっては何等限定されない。

【0012】

【実施例】以下、実施例により本発明を具体的に説明するが、本発明の実施の態様はこれにより限定されるものではない。厚さ0.6mm、直径120mmのスパイラル状のグループを有する射出成形ポリカーボネート基板のグループを有する面に、記録層としてアゾ色素を成膜した。この記録層の上に反射層として銀薄膜をスパッタ法により成膜した。一方、厚さ0.6mm、直径120mmのグループを持たない射出成形ポリカーボネート基板に感熱材料とシアニン色素を含有するレーベル記録層を成膜後、アルミニウ

ム薄膜を積層した。これら2つの基板を接着剤を用いて貼り合わせ光記録媒体を作製した。レーベル記録層側の基板から収束した波長780nmのレーザービームを照射することにより高いコントラストでレーベルを記録することができた。また、本媒体において、DVDで用いられる8-16変調記号を記録後、レーベル層の半分だけを全て記録した。この媒体を線速35m/s(10倍速相当)で回転させて波長653nmの半導体レーザーを搭載した再生装置で再生を行なったところ、良好に信号が読み出せた。

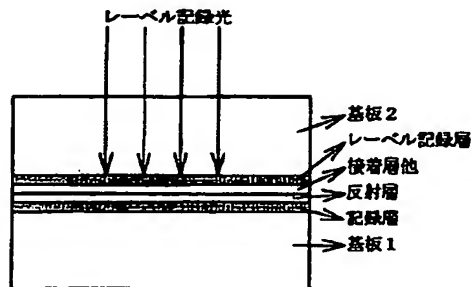
【0013】

【発明の効果】本発明によればDVD-R等における貼り合わせ型片面記録タイプの光記録媒体において直接表面に印刷しなくともレーベル表示を可能にし、外部からの付着物等による汚れに強く印字による媒体重量の片寄りが無い光記録媒体が得られる。

【図面の簡単な説明】

【図1】本発明に係る光記録媒体の層構成の一例を示す断面図である。

【図1】



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(54) [Title of the Invention] Optical recording medium

(57) Abstract

[Solving means]

An optical recording medium includes a recording layer which is provided on a transparent substrate 1 with a groove and which absorbs a laser beam directly or through another layer interposed therebetween, and a metal reflection layer which is provided on the recording layer directly or with another layer interposed therebetween. At least a label recording layer that is decomposed or is deteriorated when light is absorbed and a transparent substrate 2 are sequentially stacked on the reflection layer.

[Effect]

According to a bonded single-sided recording-type optical recording medium, such as a DVD-R, a label can be displayed even though printing is not performed directly on a surface, which is resistant to the contamination caused by the external deposit or the like, and which does not change the weight of the medium due to printing.

[CLAIMS]

[Claim 1]

An optical recording medium comprising:

a recording layer which is provided on a transparent substrate 1 with a groove and which absorbs a laser beam directly or through another layer interposed therebetween, and

a metal reflection layer which is provided on the recording layer directly or with another layer interposed therebetween,

wherein at least a label recording layer that is decomposed or is deteriorated when light is absorbed and a transparent substrate 2 are sequentially stacked on the reflection layer.

[Claim 2]

The optical recording medium according to claim 1, wherein the substrate 2 has a groove shape, and each groove of the substrates 1 and 2 has a different shape.

[Claim 3]

The optical recording medium according to claim 1, wherein the substrate 2 does not have a groove.

[Detailed Description of the Invention]

[0001]

[Technical Field]

The present invention relates to a bonding optical recording medium in which a label is printed inside the recording medium by a laser beam and the like without being printed directly on a surface thereof.

[0002]

[Background Art]

In general, in an optical recording medium, such as a CD-R, in which printing can be performed on a surface thereof, the optical recording medium has a printable layer formed thereon and label printing is performed directly on the surface by using an inkjet printer or the like. However, in the above-mentioned optical recording medium, the label printing surface is exposed. As a result, when the label printing surface shakes directly by a hand or a drink is accidentally spilled thereon, the label printing surface becomes stain or contaminated. Therefore, it is not preferable. Further, when the label printing is focused on any portion of the recording medium, a balance of the medium weight is collapsed, so that a problem may occur in a fast reading-out drive. A single-sided recording DVD-R is made basically by bonding a medium in which organic dye and a reflection layer are formed on a substrate of 0.6 mm and a substrate of 0.6 mm. Therefore, in the single-sided recording DVD-R, the label printing should be performed directly on the surface of

the medium and thus the above-described problem cannot be solved. Further, in a single-sided recording DVD-RAM, the above-described problem cannot be solved.

[0003]

[Problems to be Solved by the Invention]

Accordingly, the present invention is made up to solve the above-mentioned problems and it is an object of the present invention to provide an optical recording medium, which is capable of displaying a label even though printing is not performed directly on a printing surface, which is resistant to contamination caused by the external deposit or the like, and which does not change the weight of the medium due to printing, in a bonded single-sided recording-type optical recording medium, such as DVD-R.

[0004]

[Means for Solving the Problems]

The inventors have researched in order to solve the above-mentioned problems and completed the present invention. Specifically, the present invention provides an optical recording medium having at least a recording layer, a reflection layer, and a label recording layer between a transparent substrate 1 with a groove and a transparent substrate 2.

[0005]

[Best Mode for Carrying Out the Invention]

Hereinafter, the specific configuration of the present invention will be described. According the preferred structure of an optical recording medium of the present invention, the optical recording medium has a recording layer which is provided on a transparent substrate 1 with a groove and which absorbs a laser beam directly or through another layer interposed therebetween, and a metal reflection layer which is provided on the recording layer directly or with another layer interposed therebetween. At least a label recording layer that is decomposed or is deteriorated when light is absorbed and a transparent substrate 2 are sequentially stacked on the reflection layer. FIG. 1 is a sectional view showing the optical recording medium of the present invention.

[0006]

In a case in which the label recording layer is not provided, the optical recording medium has a common single-sided recording type. However, after manufacturing the medium by providing the label recording layer, a user can make a label by selectively irradiating label recording light, such as laser beams and ultraviolet rays, from the side of the transparent substrate 2 and causing a change in the label recording layer. Since the label recording layer is protected by the transparent substrate like a recording layer inside the recording medium, it is

hardly affected by the external deposit or the like. Moreover, if the surface of the substrate is contaminated, it is possible to wipe the surface cleanly. Further, since the weight change of the label recording layer is not caused by the light, even though the recording is focused on any portion of the medium, the balance of the medium weight is constant, so that a problem does not occur in a high speed reading-out drive.

[0007]

Further, basically, the substrate 2 may be the same as the substrate 1, but it may not have the groove. The substrate 2 may be provided with a groove having a predetermined design in advance, if needed, such that it is possible to give a decorative design.

[0008]

For the substrates 1 and 2, a known resin substrate made of an acryl resin, a polycarbonate resin, and a polyolefin resin can be exemplified. Generally, the recording layer can be composed of an organic dye or a phase change inorganic material. Examples of the organic dye may be porphyrin dye, cyanine dye, azoic dye, dipyrromethene dye, polymethine dye, and naphthoquinone dye which can be used. Examples of the phase change inorganic material may be an alloy material including Ge, Sb, and Te as main materials, or an alloy material including metals

such as Ag, In, Sb, and Te as main materials.

[0009]

For the reflection layer, metals such as gold, silver, aluminum, copper and platinum, and an alloy including these metals can be used. In order to improve the recording sensitivity, the reflectance, or the repetitive recording characteristics, an inorganic dielectric layer made of materials such as ZnS, SiO<sub>2</sub>, SiN or a layer composed of polymer may be disposed between the substrate 1 and the recording layer or between the recording layer and the reflection layer.

[0010]

As a material for the label recording layer, a heat sensitive material (ink) such as royco dye or a developer such as bisphenol A, which is selected depending on the sensitivity of recording light or the contrast after recording, can be used in addition to the organic dye or the phase change inorganic material used in the above-described recording layer. Further, it is possible to use the mixture thereof. Further, an optimal film forming method can be selected depending on the material. As a specific method, a known method such as a vacuum deposition method, a sputtering method, a spin coating method, a dip-coating method, a spray coating method, a roll coating method, and a screen printing method can be

exemplified.

[0011]

Further, a layer composed of a metal, an inorganic dielectric, or a polymer may be provided to be adjacent to the label recording layer for improving the contrast and the sensitivity. Further, it is possible to give a functional property such as multi-colors by forming a different kind of label recording layer on the recording layer directly or with the layer interposed therebetween. The present invention is not limited with respect to the material of the recording layer at the side of the recording medium, that is, at the side of the substrate 1, the material of the reflection layer, or the layer construction.

[0012]

[Embodiments]

Hereinafter, the present invention will be described in detail using an embodiment, but the embodiment of the present invention is not limited thereto. A film of the azoic dye serving as a recording layer is formed on a side with a groove of a polycarbonate substrate which has a thickness of 0.6 mm and a diameter of 120 nm, which is injection-molded and which has a spiral shaped groove. A silver thin film serving as a reflection layer is formed on the recording layer by a sputtering method. On the

other hand, a label recording layer containing the heat sensitive material and a cyanine dye is formed on the injection-molded polycarbonate substrate, which has a thickness of 0.6 mm and a diameter of 120 mm and which does not have the groove, and then an aluminum thin film is laminated thereto. The two substrates are bonded with each other using adhesive to thus manufacture the optical recording medium. It is possible to record a label with a high contrast by irradiating a converged laser beam with a wavelength of 780 nm from the substrate located at the side of the label recording layer. Further, after 8-16 modulated symbols used for DVDs are recorded on the present medium, half of the label layer is recorded. The medium is rotated at a line speed of 35 m/s (corresponding to 10X) and then regenerated using a regenerating device on which a semiconductor laser with a wavelength of 653 nm is mounted. As a result, an excellent signal is read out.

[0013]

#### [Advantages]

According to the present invention, it is possible to provide an optical recording medium, which is capable of displaying a label even though printing is not performed directly on a surface, which is resistant to a contamination caused by the external deposit or the like, and which does not change the weight of the medium due to

the printing, in a bonded single-sided recording-type optical recording medium such as DVD-R.

[Brief Description of the Drawings]

[FIG. 1] FIG. 1 is a sectional view illustrating an example of the layer configuration of an optical recording medium according to the present invention.

[Name of Document]

DRAWINGS

[FIG. 1]

LABEL RECORDING LIGHT

2: SUBSTRATE

LABEL RECORDING LAYER

ADHESIVE LAYER

REFLECTION LAYER

RECORDING LAYER

1: SUBSTRATE